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ABSTRACT

Instructional modules are self-contained units that include all the information and materials necessary for mastery of one or more competencies. One module design consists of seven components: a) a description of the field in which competency is to be demonstrated; b) the concept and rationale for including the module in the total program; c) the specific skill to be developed; d) objectives, or a delineation of anticipated student behavior; e) the specific objects, readings, instruments, and other instructional materials which will facilitate competency development; f) the learning activities to be undertaken by the student in order to achieve the module objectives; and g) assessment procedures and evaluative instruments that relate specifically to the behavioral objectives of the module. Analytical attributes of an instructional module are its conceptual level; content area; learning and instructional modes; access skill focus (observation, listening, and/or reading); competency target (age or grade level); and estimated completion time for the module. There are several approaches to module development, but in general, the most effective is cooperative development by two or more instructors who pretest and refine the module before including it in the total program. (HMD)

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Joel Burdin

INSTRUCTIONAL MODULES: THE TOOL OF PROGRAM DEVELOPERS

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The role of program developer is new to the field of education. Historically, teachers, administrators, consultants and anyone else who was available accepted the responsibility for planning and implementing new educational programs. Although the role of program development specialist is just beginning to emerge, "developer" functions are often poorly defined. It is nearly always accepted that a program developer must create or adapt instructional designs vis-a-vis the specialized needs of any given educational environment. In order to accomplish this, three tasks appear minimally necessary:

1. A thorough understanding of the components which form the conceptual base for the program;
2. A thorough understanding of the significant factors or attributes of each component; and
3. The ability to design and implement a strategy for program development which incorporates the above two.

The intent of this essay is to propose a conceptual base, present one possible set of analytical attributes, and finally, to suggest a strategy for initial program implementation.

Instructional Modules

Instructional modules came into being as a direct result of the movement toward competency based education in the field of teacher preparation. Briefly, modules are self-contained instructional units, including all of the information and materials necessary for a

student to undertake the training necessary to master a competency or set of competencies. The fact that they are self-contained, however, does not imply isolation. On the contrary, an instructional module must be considered a single component in a much more complex program that is designed to produce competency in a specific field. One of the problems frequently plaguing competency based program developers is that a well articulated, complete program has not been fully conceptualized and communicated prior to the initiation of the development of modules. Such is the cross that must be carried by those who choose to explore in a new area, and apologies should be neither expected nor offered. The extent to which the program remains open and responsive to feedback, is the extent to which the total program can develop as time goes on. Innovation, like invention does not always follow a deductive process.

Instructional modules are synthetic. They are man made, not only in terms of their structure and organization, but also in terms of the relationship they possess (or don't possess) with any natural order that exists. They represent the best efforts of the day in attempting to understand a very complicated problem and the relating of that problem to the development of skills in a particular field. As program developers become more sophisticated, and as the nature of the problem(s) become better understood, any instructional program will become more efficient in realizing its goals. This point is made to underscore the notion that no educational endeavor should ever be viewed as the ultimate training program, and furthermore,

that those who are either courageous or presumptuous enough to work in this area must remain open and sensitive to new information and ideas.

Modules imply a structure. But a structure only of the instructional program, not of any body of knowledge or set of complex skills. In other words, the design by which instruction is delivered to the student ought to be organizationally defensible. It must also be very flexible so that a variety of content areas can be easily accommodated. However, an instructional module and its explicit structure is, and must be, totally independent of the organization of the various content areas which are delivered through it. One structure for the development of instructional modules will be presented in this paper, but others may serve equally as well.

The problem of labels is also encountered. Some people feel the need for an a priori safeguard system of labels, while others feel constrained with even the most ambiguous of terms. This is a straw man issue! Some form of descriptive terminology must be used for the sake of communication, yet the importance rests with the function implied by any label or term. Consequently, although we will be calling various "things" by various "names," we will also go to pains in order to identify the function of the "thing" that is implied.

Components of Instructional Modules

As previously stated, instructional modules are part of a larger, more complex plan that is designed to guide instruction toward

competency in a specific area. We have identified seven program components: two of which are super-ordinate to the actual module; four of which are sub-ordinate; and one of which identifies the level of the module in the total structure.

Super-ordinate	1. Competency Area 2. Concept and Rationale
Module Level	3. Competency
Sub-ordinate	4. Objectives 5. Learning Activities 6. Instructional Materials 7. Assessment Procedures

Table 1.--The Relationship of Modules to the Structure of a (Competency Based) Education Program.

Competency Areas--Descriptions of the basic areas which comprise the totality of the field in which competency is to be demonstrated. Often, Competency Areas will resemble content areas which most educators would agree are inherent in the field. They should be stated in terms general enough to allow many competencies to be logically related at a later time.

Functions:

1. To serve as an organizer for the development of the entire competency program.

2. To serve as guides for the development of the sub-ordinate components.
3. To communicate the conceptual base and content of the total program in general terms.

Concepts and Rationale--Statements describing a phenomenon or phenomena which has an empirical base (may or may not be a "finding" from a specific discipline) and which has a relatively high degree of transferability. Implicit in the concept is the rationale for inclusion in the program. When that relationship is not readily apparent, the rationale should be made explicit.

Functions:

1. To act as an advanced organizer for the entire module.
2. To act as a guide for the development of competencies.
3. To serve as the most general form of external criteria, suggesting the transferability or power of the module.

Competency--Goal statements in common language specifying the competency or skill to be developed. Competencies are specific, yet they are not stated in behavioral terms. They specify the "ends," but do not detail the "means" used in the process of competency development.

Functions:

1. To serve as a guide for the development of instructional objectives.
2. To make explicit the actual competencies or skills to be developed.

3. To serve as a "second order" external criteria for the assessment of program efficacy.

Objectives--Precise statements of student behavior which lend themselves to observation and to low inferencing. Usually, the statement should include what a student is expected to do, under what conditions the effort is to be made, and the criteria to be used as a basis for satisfactory completion. Desirable objectives often exceed the scope of readily available assessment instruments.

Functions:

1. To assist in becoming more specific about the intended student outcomes as a partial result of any planned activity.
2. To act as acceptable evidence (either partial or complete) of competency mastery.
3. To serve as a guide for the development of specific learning activities.
4. To provide the student with some on-going measure of his or her accomplishment.

Learning Activities--Activities to be undertaken by the students which allow alternative modes for teaching and learning and which serve as a means for satisfactorily achieving the objectives. Learning activities may involve interaction with an instructor, may be performed independently, or may involve aspects of both. They may involve an interaction with specific materials, or they may occur independent of materials.

Functions:

1. To provide alternative means for assisting students in the achievement of specific objectives, and therefore coupetencies.
2. To provide a "controlled" experience in which there is an on-going feedback process between student-student, and/or student-instructor, and/or student-material.
3. To provide differential means for assisting students to achieve competencies through approaches related to different learning styles and a variety of learning contexts.

Instructional Materials--As opposed to a learning "experience" in which the ingredients or "raw materials" are in the situation, instructional materials are those specific objects, instruments, readings, graphics, etc., which are needed in order to facilitate the implementation of a desired learning activity.

Functions:

1. To accommodate, by the selection of specific materials, the different learning modes which may be appropriate in a particular module (Cognitive, Affective, Psycho-motor, and/or a combination).
2. To indicate the primary Access Skills needed to address the learning activities within a specific module (Reading, Listening, Observation, and/or a combination).
3. To indicate both a feasibility and consistency between procedures to be used in a learning

activity and the materials which facilitate the procedures.

4. To assist students to achieve competencies in the most effective fashion.

Assessment Procedures--An instrument or activity accompanying each module which specifically relates to the behavioral objectives addressed in each module. Preassessment procedures will be used when appropriate. Post-assessment procedures will be used consistently to assess the exit-level of competency development.

Functions:

1. To determine the entry-level and/or the exit-level of the student.
2. As a pre-instructional tool, to guide the instructor and the student in individualizing the student involvement with the module. Not every student will have to complete all segments of a module.
3. As a post-instructional tool, to provide feedback to the student and to the instructor regarding student attainment of the specific objectives.
4. To guide, if necessary, pre-instructional modification of the learning activities and post-instructional selection of remedial activities.

The Competency Area and the Concept and Rationale are identified as precursors to every instructional module. Because they are superordinate to the module itself, more than one module may be generated from various concepts, while it is certain that several modules will be included as part of any Competency Area.

Each module, then, is developed around specific competencies (there is no set number per module) which will be demonstrated by meeting the criteria specified in the objectives. Usually specific learning activities and instructional materials will be used to aid the student in the competency achievement. It should be noted that although the statement of competencies and objectives (along with the specification of activities and materials) lend a new level of openness and precision to the instructional endeavor, the involvement of the student with an instructor, and/or materials will always be the cornerstone of any educational program. In other words, don't let the new emphasis fool you: The intent of an instructional module in a competency based program is simply to enhance the quality of these crucial student-program interactions.

Analytical Attributes of Instructional Modules

One could undoubtedly create numerous strategies for analyzing instructional modules, depending on the purpose of the analysis. With the goal of rendering the module more understandable, and hence easier to implement, we have selected eight module attributes. They reflect one approach to program delivery, and are very definitely related to the constraints of a particular educational setting. Although they would be transportable to another program, the developers of that program would have to assess their applicability. In some cases, for example, time parameters are not an issue, and in some situations, the instructional setting may be highly prescribed rather than a field

based option. Yet, in order to see how analytical attributes can be helpful, a single set will be presented here.

Attributes / Components	Conceptual Level	Content Area	Learning Mode	Instructional Mode	Situation	Skill Focus	Competency Target	Estimated Time
Competencies & Objectives	x	x						
Learning Activities	x	x	x	x	x	x	x	x
Instructional Materials	x	x	x	x	x	x	x	x
Assessment Procedures	x	x			x	x		x

Table 2.--The Applicability of Attributes for Analyzing Module Components.

Conceptual Level--Each module assumes a certain conceptualizing level or levels to be used by students when addressing the learning activities. The learning activities demand certain cognitive skills and reflect varying degrees of conceptual complexity. For module use, we have determined three general conceptual "levels." Those are offered for instructional purposes and do not imply a given sequence.

Level 1 includes the use of activities and materials that require the student to function primarily with memory-recall. Level 2 includes the use of activities and materials that require the student to use data (experiential or quantified) to reach some established end (concept, principle, conclusion, hypothesis, etc.). Level 3 includes the use of activities and materials that require the student to move beyond a convergent reference and into divergent creative and evaluative experiences.

Functions:

1. To assist in "matching" student entry levels with specific activities and materials.
2. To assist in identifying the cognitive skills necessary for satisfactory module completion.
3. To assist instructors and students in the development of alternative activities, thus allowing the student to achieve specific objectives.

Content Areas--Although concepts and objectives may be generalizable, the specific materials and learning activities in a module may focus on a specific content area. A particular module may be generalizable to all content areas and/or may use a variety of learning activities having a skills focus in lieu of a content focus. The Content Area (if one exists) should be identified for each module.

Functions:

1. To assist in helping match individual student learning modes with learning activities.

2. To assist in helping students phase into functioning within multiple modes both as learners and as teachers.

Instructional Mode--Instructors and/or learning activities have a tendency to emphasize certain strategies and instructional approaches, e.g., lecture, small group discussion, facilitating activities, independent study, and so on. Just as with Learning Modes, there is no one pure Instructional Mode. However, relative emphasis is usually given to various approaches by specific instructors. We have identified four general Instructional Modes. Mode 1--The first mode is tightly structured and controlled. The instructor or learning activity uses specific information and controls the ways by which the information is to be used. (Example: Lecture-recitation). Mode 2--The divergent mode, with some process control, allows the instructor or learning activity multiple sources of information yet places some control over the processing of the information. (Example: task-oriented group discussion). Mode 3--The loosely structured and loosely controlled mode involves an instructor or learning activity having no pre-set ends or means yet operated within a broad goal context. (Example: Observe a community board meeting and share what you have observed.) Mode 4--With behavior modification, the environment is such that the principles of operant conditioning are actively used to control the range and variation of instruction. (Example: Token economy for reading.)

Functions:

1. To assist in matching individual learning modes and conceptual levels with teaching modes.
2. To assist in monitoring modes of instruction in order to ensure a variety of approaches.

Situation--The specific place or general situation in which the module is to be addressed. For example, the situation may be the classroom or the school, or it may be specified observations outside of the school context. In a field centered program, however, it is important to use this attribute to ensure that all aspects of the field are included in the program.

Functions:

1. To assist in developing a variety of learning situations.
2. To assist in determining the relationship among various situations.
3. To assist in monitoring situation effectiveness in student efforts to satisfactorily complete module requirements.

Skill Focus--Learning activities usually focus on one of three primary Access Skills--those skills used in securing information and experience. The Access Skills are:

1. Observation.
2. Listening.
3. Reading.

A number of learning activities include using all three Access Skills to some degree, either as separate skills or skills interacting with

one another. However, there is usually a primary Access Skill at work in most learning activities. Learning Activities also usually bring some primary focus to cognitive Process Skills--those skills needed and used to "process" the information or experience gained as a result of having "access" to the information or experience. For example, "categorizing" would be such a skill.

Functions:

1. To assist the student in determining the primary "access" mode being used.
2. To assist the student in determining the primary "process" skills needed to complete the module.
3. To provide some means of monitoring how much program emphasis is being placed within the context of specific skills.
4. To assist the student in working on specific skill development (regardless of content) if there is an apparent need.

Competency Target--Although the objectives addressed by a specific module may be generalizable to a number of teaching situations, the activities may focus at specific grade or age level targets. If that is the case, the developer should, as specifically as possible, set the age or grade level for which the activities are designed.

Function:

1. To assist the student and instructor in planning a program and choosing activities in the most economical fashion.

Estimated Time--This is a difficult, yet necessary bit of information. When assessing a module and module activity requirements, the module developer should make an effort to approximate the time factor. The approximation should be within a perceived minimum-maximum range such as 4-8 hours, or 2-1/2 to 3 weeks.

Functions:

1. To assist in program planning and module selection.
2. To assist in determining time-area-module relationships as part of the instructional program.

Strategies for Module Development

Often, when a format or an organizational structure is presented, it is assumed that development should follow the format in a linear fashion. This usually leads to charges of a mechanistic, inhuman program. Do not be misled! There is absolutely no intention to prescribe a developmental process. Rather, the format is designed to suggest a logical communication device for relating each "unit" within a larger context. Just as a research report is logically presented but is not necessarily a description of the developmental process, so a module may be developed in a number of different ways. Some people start with the concepts and then continue logically through the module. Others start with the learning activity and move back and forth, finally bringing all of the parts together. Still others may start with some material and evolve a module by deciding where the

material might "fit" and the functions it might serve. There simply is no one established, acceptable way to develop an instructional module.

In view of the fact that many instructors have difficulty developing a module in isolation, a team approach is often advisable. In addition to that, it would probably be helpful to develop the module after it has been tried at least once. The team would consist of two or more members, but would probably not be larger than five or six. They would arrange their schedules so that each time an instructor is involved with students in an instructional setting, at least one other team member would be present, solely for developmental purposes. In this fashion, concepts, competencies and objectives could be drawn from the instructional effort rather than the other way around. A simple "debriefing" meeting subsequent to the instructional session could provide the setting for these module components to be agreed upon.

Nothing, of course, would prevent an instructor from having the objectives conceptualized prior to instruction, but because this process has proven difficult for many, it would not be necessary. The role of the observers would be to observe the instruction, review the readings, films and other materials, and abstract from these the concepts, competencies and objectives. Also, they could suggest instructional strategies other than those used by the instructor, as well as potential assessment techniques.

After the debriefing session, the instructor would have the responsibility of taking these data and developing the module. It should be noted that this process will not occur after every observation, as the instruction will often cover more than a single period.

Once the module has been completed, it would be returned to the team members for final suggestions. The finished product could then be adopted for the program, and would be ready for future instruction. In this fashion, every module would be the product of at least one field trial.

The module could then be reused with a new group of students (this would be an improved version based on the feedback obtained the first time through). Or, the instructor could start the development of a new instructional module. Finally, the instructor could become an observer, and another member of the team could initiate the developmental process. The best technique would probably be an integrated schedule allowing each team member to be continuously involved as both an observer and developer.

This simple plan (and it was made simple purposefully) was presented only to suggest a single process for the development of instructional modules. It was not intended to be revolutionary, but rather facilitating. At the minimum it simply requires two or more professionals willing to work together and willing to be observed by their colleagues as they work. No doubt the reader can either improve on the plan or suggest an alternative.

As the position of program development specialist becomes more sophisticated, a variety of sound conceptual approaches, situational attributes and developmental strategies will emerge. Inasmuch as program development is literally developmental in nature, this suggests that those who fill these positions must continually reassess the bases from which they operate if instructional modules or any other educational inventions are to truly serve as useful tools.